

## Heavy Duty Pressure Transducers

PX3 Series, 1 bar to 46 bar | 15 psi to 667 psi

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Issue A

Datasheet



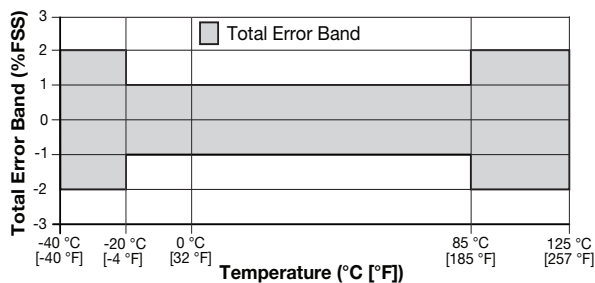
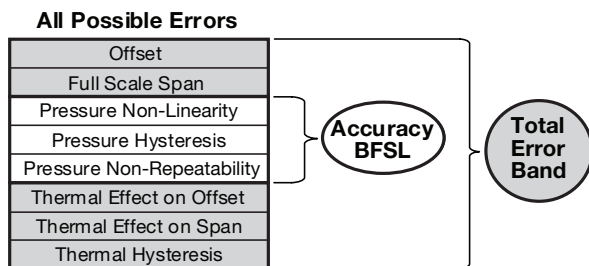
### DESCRIPTION

Honeywell's PX3 Series Pressure Transducers use piezoresistive sensing technology with ASIC (Application Specific Integrated Circuit) signal conditioning in a brass housing and Metri-Pack 150 electrical connector. The PX3 Series are fully calibrated and temperature compensated from -40 °C to 125 °C [-40 °F to 257 °F].

### VALUE TO CUSTOMERS

- Total Error Band (TEB) ( $\pm 1.0$  %FSS typ.): Provides the most comprehensive, clear and meaningful indication of the sensor's true measurement performance over a specified temperature range; small error promotes system uptime and efficiency. (See Figure 1.)

Figure 1. TEB Definition and Temperature Performance



- High insulation resistance and dielectric strength: Protect the user and sensor in high over-voltage situations, and ensures that the device is compliant with industry standards.
- High EMC performance: Operates reliably in the presence of electro-magnetic fields, such as near wireless signals, RF communication, and electrical devices.

Sensing and Productivity Solutions

- High external freeze/thaw resistance: Survives exposure to frost, commonly found in refrigeration systems. (See Figure 2.)

Figure 2. PX3 Series External Freeze/Thaw



(Shown with mating connector. See Figure 5.)

- Low current consumption: Helps to reduce energy costs, and enhances product life if used in battery driven systems.
- Media compatibility: Common HFC (hydrofluorocarbon) refrigerants, next generation low global warming potential (GWP) refrigerants such as R32 and R1234ZE, petroleum oils, lubricants, hydraulic fluids, brake fluids, air and water. For ammonia and other corrosive media, see Honeywell's MLH Series and SPT Series.

### DIFFERENTIATION

- Efficient: Proven, tight TEB accuracy (See Figure 1.).
- Great customer value: Multiple configuration possibilities with the right combination of features provide flexibility of use in the application; configurability on standard ports, pressure reference type, media seal type, and pressure range with no upfront NRE or tooling charges.
- Durable: Provides the tough environmental specs needed, including insulation resistance and dielectric strength, freeze-thaw resistance (see Figure 2), and EMC performance.

### FEATURES

- Pressure range: 1 bar to 46 bar | 15 psi to 667 psi (absolute and sealed gage)
- Ratiometric output: 0.5 Vdc to 4.5 Vdc
- Fully calibrated and temperature compensated
- Total Error Band:  $\pm 1.0$  %FSS from -20 °C to 85 °C [-4 °F to 185 °F]
- External freeze/thaw resistance: 6 cycles from -30 °C to 50 °C [-22 °F to 122 °F]
- Insulation resistance: >100 MOhm, 1500 Vdc
- Dielectric strength: AC1500V, 1 min. or AC1800, 1 s
- Current consumption: 3.5 mA max.
- EMC Radiated Immunity: 200 V/m per ISO 11452-2
- Ingress protection up to IP67
- Response time: <2 ms
- RoHS, REACH, and CE compliant

### POTENTIAL APPLICATIONS

- Industrial: Refrigerant pressure monitoring in HVAC/R systems; air compressor system pressure
- Transportation: Air system monitoring; hydraulic oil pressure monitoring

### PORTFOLIO

Honeywell's PX3 Series joins the PX2 Series, MLH Series, and SPT Series heavy duty pressure transducers.

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**Table 1. Electrical Specifications**

Characteristic	Parameter
Supply voltage	5 Vdc $\pm$ 0.25 Vdc
Over voltage and reverse voltage	$\pm$ 16 Vdc
Current consumption	3.5 mA max.
Nominal output transfer function	0.5 Vdc to 4.5 Vdc (ratiometric to supply)

**Table 2. Performance Specifications (At 25 °C [77 °F] and under unless otherwise noted.)**

Characteristic	Parameter
Operating temperature range <sup>1</sup>	-40 °C to 125 °C [-40 °F to 257 °F]
Storage temperature range <sup>1</sup>	-40 °C to 125 °C [-40 °F to 257 °F]
Compensated temperature range	-40 °C to 125 °C [-40 °F to 257 °F]
Total Error Band <sup>2</sup> : -20 °C to 85 °C [-4 °F to 185 °F] ——— <-20 °C, >85 °C [<-4 °F, >185 °F] ———	$\pm$ 1.0 %FSS $\pm$ 2.0 %FSS
Accuracy BFSL <sup>3</sup>	$\pm$ 0.25 %FSS
Response time	<2 ms (10% to 90% step change in pressure)
Turn on time <sup>4</sup>	<7 ms
EMC rating: electrostatic discharge ——— radiated immunity ——— fast transient burst ——— immunity to conducted disturbances radiated emissions ——— radiated immunity ———	$\pm$ 4 kV contact, $\pm$ 8 kV air per IEC 61000-4-2 10 V/m (80 MHz to 1000 MHz) per IEC 61000-4-3 $\pm$ 1 kV per IEC 61000-4-4 3 V per IEC 61000-4-6 40 dB (30 MHz to 230 MHz), 47 dB (230 MHz to 1000 MHz) per CISPR 11 200 V/m per ISO 11452-2
Insulation resistance	>100 MOhm, 1500 Vdc
Dielectric strength	AC1500V, 1 min. or AC1800V, 1 s
Load resistance	>5 kOhm
Life	greater than 10 million full scale pressure cycles over the calibrated pressure range

<sup>1</sup> Dependent on seal material. See Table 5.

<sup>2</sup> Total Error Band: The maximum deviation from the ideal transfer function over the entire compensated temperature and pressure range. Includes all errors due to offset, full scale span, pressure non-linearity, pressure hysteresis, pressure non-repeatability, thermal effect on offset, thermal effect on span, and thermal hysteresis. See Figure 1.

<sup>3</sup> Accuracy: The maximum deviation in output from a Best Fit Straight Line (BFSL) fitted to the output measured over the pressure range at 25 °C [77 °F]. Includes all errors due to pressure non-linearity, pressure hysteresis, and pressure non-repeatability. See Figure 1.

<sup>4</sup> Turn on Time: Duration from power applied until first valid output.

**Table 3. Pressure Reference Definitions**

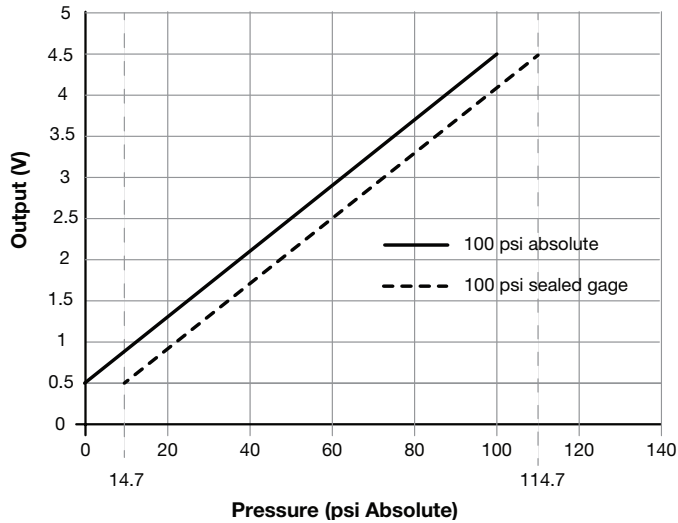
Pressure Reference	Definition
Absolute	Output is calibrated to be proportional to the difference between applied pressure and a fixed reference to perfect vacuum (absolute zero pressure).
Sealed gage <sup>1</sup>	Sensor construction is identical to the absolute version with a built in reference at zero pressure in order to minimize measurement error over temperature. The output is calibrated to be proportional to the difference between applied pressure and a reference of 1 standard atmosphere (1.013 barA   14.7 psiA). Example: 100 psi sealed gage has a calibrated pressure range from 14.7 psi absolute to 114.7 psi absolute. (See Figure 3.)

<sup>1</sup> Sealed gage option only available in pressure ranges at or above 8 bar | 100 psi.

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**Figure 3. Absolute vs Sealed Gage Pressure vs Output**



**Table 4. Pressure Ratings**

bar			psi		
Operating Pressure	Over-pressure	Burst Pressure	Operating Pressure	Over-pressure	Burst Pressure
1	5	8	15	70	115
1.6	5	8	30	150	250
2	10	17	50	250	400
2.5	10	17	100	450	750
4	17	27	150	450	750
6	31	51	200	450	1150
8	31	51	250	450	1150
10	31	51	300	1000	1500
16	32	80	500	1000	1500
20	69	103	600	1000	1500
25	69	103	667	1000	1500
35	69	103	-	-	-
40	69	103	-	-	-
46	69	103	-	-	-

**Table 5. Environmental and Mechanical Specifications**

Characteristic	Parameter
Shock	100 G per MIL-STD-202G, Method 213B, Cond. F (at 25 °C [77 °F])
Vibration	20 G sweep, 10 Hz to 2000 Hz (at 25 °C [77 °F])
Ingress protection	IP67
Humidity	0 %RH to 95 %RH, non-condensing
External freeze/thaw resistance	>6 cycles from -30 °C to 50 °C [-22 °F to 122 °F]
Wetted materials:	
port	brass C36000 (Pb content: 3.7% max.)
internal media seal	seal material as required by the application (see seal material media compatibility options below)
sensing element and substrate	alumina, glass, silicon
adhesives	epoxy
Seal material media compatibility <sup>1</sup> :	
HNBR (option H)	refrigerants, petroleum oils, lubricants
silicone (option S)	air, water, hydraulic fluids
Other materials:	
Metri-Pack 150 electrical connector	PBT 30% GF
external O-ring seal on G1, M1 ports	nitrile

<sup>1</sup>Honeywell can assist with selecting suitable seal material for the media based on the seal manufacturer's recommendation. The customer should test the compatibility with the media to ensure that it is correct for the application.

## CAUTION PRODUCT DAMAGE

- Ensure torque specifications are determined for the specific application. Values provided are for reference only. (Mating materials and thread sealants can result in significantly different torque values from one application to the next.)
- When using mating parts made of stainless steel, use a thread sealant with anti-seize properties to prevent thread galling. Ensure the sealant is rated for the application.
- Use appropriate tools (such as an open ended wrench or deep well socket) to install transducers.
- Always hand-start transducers into the hole to prevent cross threading and damage.
- Ensure that torque is not applied to the electrical connector.
- Ensure that the proper mating electrical connector with a seal is used to connect the transducer. Improper or damaged seals can compromise ingress protection leading to short circuits.

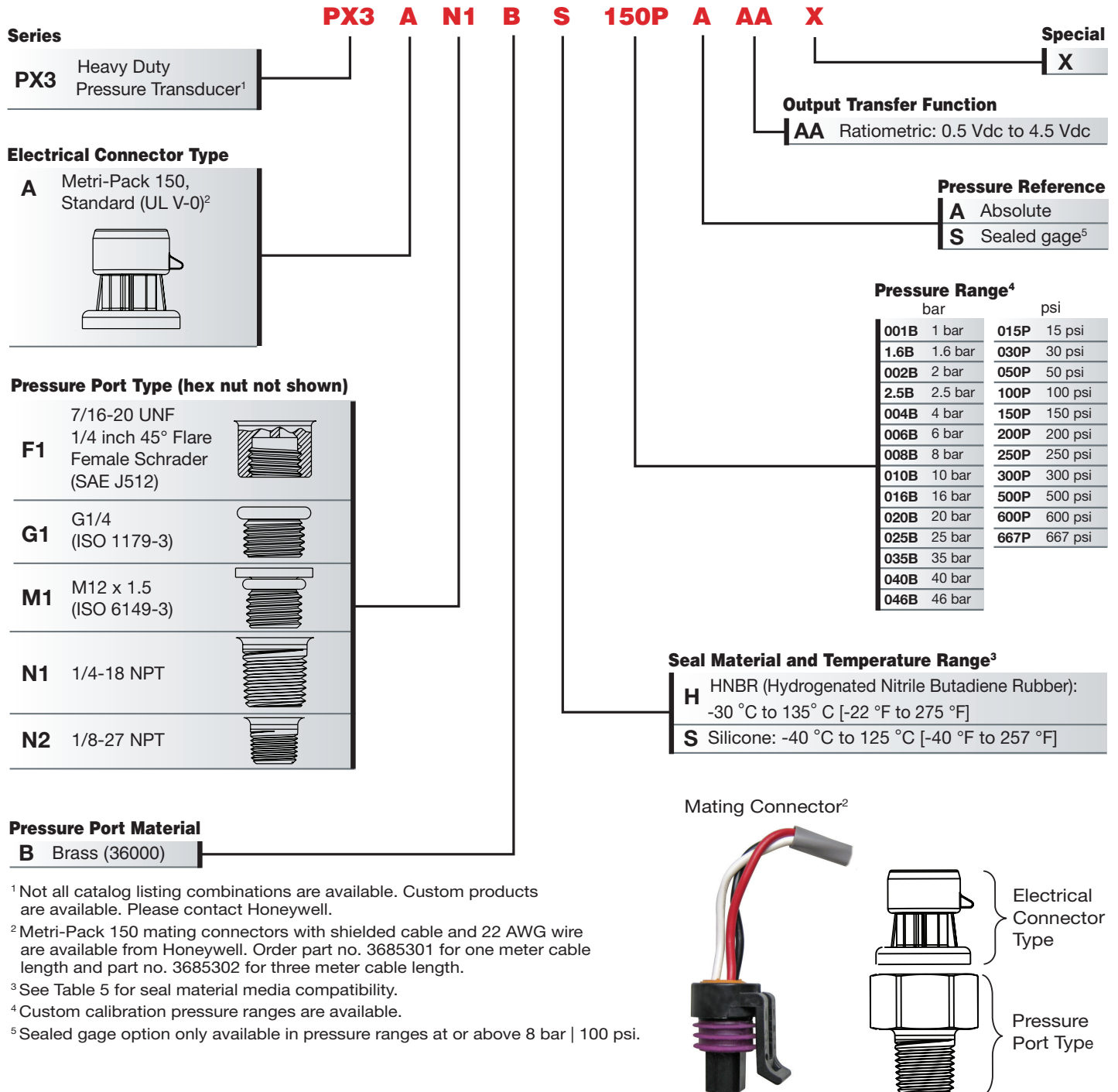
**Failure to comply with these instructions may result in product damage.**

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Figure 4. Nomenclature and Order Guide

For example, **PX3AN1BS150PAAAX** defines a PX3 Series Heavy Duty Pressure Transducer, Metri-Pack 150, standard (UL V-0) electrical connector type, 1/4-18 NPT pressure port type, brass pressure port material, silicone: -40 °C to 125 °C [-40 °F to 257 °F] seal material and temperature range, 150 psi pressure range, absolute pressure reference, ratiometric: 0.5 Vdc to 4.5 Vdc output transfer function, no special



<sup>1</sup> Not all catalog listing combinations are available. Custom products are available. Please contact Honeywell.

<sup>2</sup> Metri-Pack 150 mating connectors with shielded cable and 22 AWG wire are available from Honeywell. Order part no. 3685301 for one meter cable length and part no. 3685302 for three meter cable length.

<sup>3</sup> See Table 5 for seal material media compatibility.

<sup>4</sup> Custom calibration pressure ranges are available.

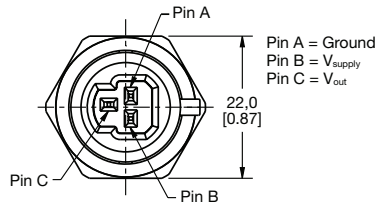
<sup>5</sup> Sealed gage option only available in pressure ranges at or above 8 bar | 100 psi.

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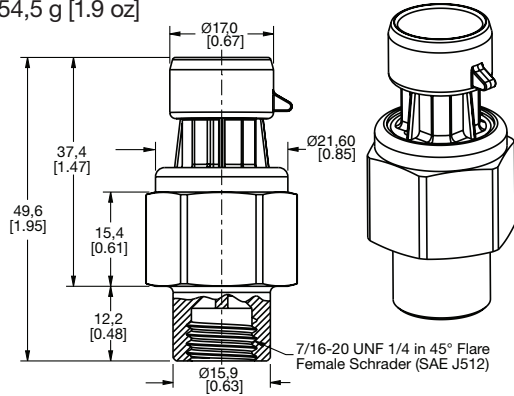
Figure 5. Mounting Dimensions Shown by Pressure Port Type (For reference only. mm/[in].)

**Pinout for all pressure port types**



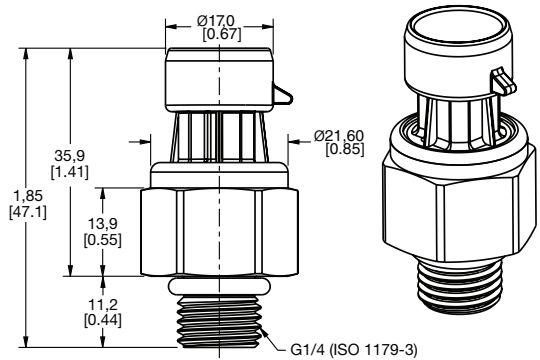
**F1: 7/16-20 UNF 1/4 inch 45° Flare Female Schrader (SAE J512)**

Seal: 45° cone  
Mating geometry: SAE J512  
Installation torque: 17 N m [12.5 ft-lb]  
Weight: 54,5 g [1.9 oz]



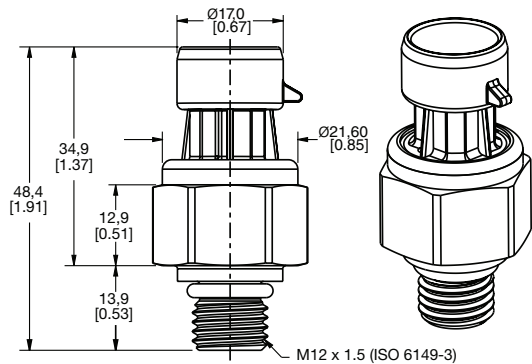
**G1: G1/4 (ISO 1179-3)**

Seal: O-ring  
Mating geometry: ISO 1179-1  
Installation torque: 50 N m [36.9 ft-lb]  
Weight: 35,1 g [1.2 oz]



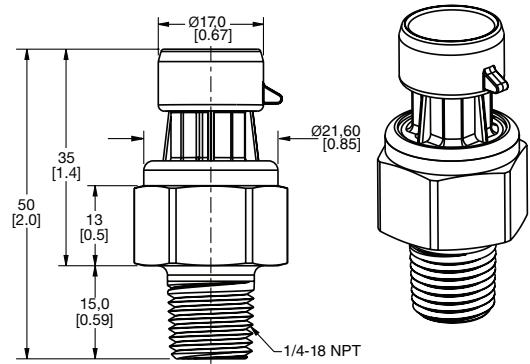
**M1: M12 x 1.5 (ISO 6149-3)**

Seal: O-ring  
Mating geometry: ISO 6149-1  
Installation torque: 25 N m [18.4 ft-lb]  
Weight: 33,9 g [1.2 oz]



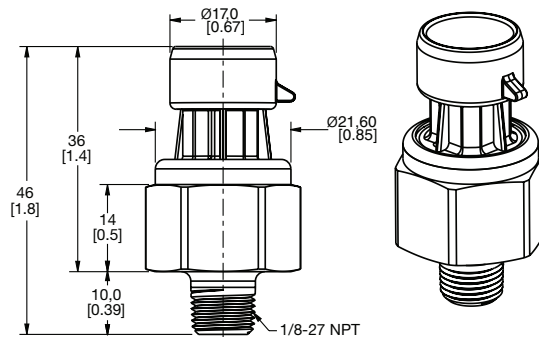
**N1: 1/4-18 NPT**

Seal: Pipe thread  
Mating geometry: ANSI B1.20.1  
Installation torque: Two to three turns from finger tight  
Weight: 35,1 g [1.2 oz]



**N2: 1/8-27 NPT**

Seal: Pipe thread  
Mating geometry: ANSI B1.20.1  
Installation torque: Two to three turns from finger tight  
Weight: 31,2 g [1.1 oz]



## ADDITIONAL INFORMATION

The following associated literature is available on the Honeywell web site at [sensing.honeywell.com](http://sensing.honeywell.com):

- Product line guide
- Product range guide
- Product installation instructions
- Application notes:
  - Heavy Duty Pressure Transducers, PX2 Series and PX3 Series
  - PX2 Series and PX3 Series Heavy Duty Pressure Transducers for Potential Use in Industrial Refrigeration
  - PX2 Series and PX3 Series Heavy Duty Pressure Transducers for Potential Use in Industrial HVAC/R Applications
- Technical notes:
  - Total Error Band Specification for Honeywell Heavy Duty Pressure Transducers, PX2 Series and PX3 Series
  - Media Compatibility for Honeywell Heavy Duty Pressure Transducers, PX2 Series and PX3 Series
- CAD models (see bottom of home page at [sensing.honeywell.com](http://sensing.honeywell.com))

## Find out more

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors.

For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office.

To learn more about Honeywell Sensing and Productivity Solutions' products, call **+1-815-235-6847** or **1-800-537-6945**, visit **[sensing.honeywell.com](http://sensing.honeywell.com)**, or e-mail inquiries to **[info.sc@honeywell.com](mailto:info.sc@honeywell.com)**

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## **⚠ WARNING** **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

## **⚠ WARNING** **MISUSE OF DOCUMENTATION**

- The information presented in this datasheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

## Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective.

**The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

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